

REMARKS

The present Amendment is in response to the Office Action having a mailing date of March 1, 2004. Claims 1-21 remain pending in the present Application.

Applicant has amended the specification, changing the title and correcting a minor error. Applicant respectfully submits that the amendments to the specification do not introduce new matter.

In the above-identified Office Action, the Examiner objected to the specification. In particular, the Examiner objected to the title because the claims are drawn to a semiconductor device, not a method for providing a semiconductor device. The Examiner also objected to an error found on page 5, line 17 of the specification.

Applicant has amended the title to be for "SHIELDED MAGNETIC RAM CELLS" rather than a method or system for producing such cells. Applicant has also amended the specification to correct the minor error noted by the Examiner. Accordingly, Applicant respectfully submits that the Examiner's objections to the specification have been addressed.

In the above-identified Office Action, the Examiner rejected claims 1-3 under 35 U.S.C. § 102 as being anticipated by U.S. Patent No. 5,898,548 (Dill). The Examiner cited Fig. 3A of Dill in his rejection of claim 1. In rejecting claims 2 and 3, which recite the use of two shield layers having perpendicular easy axes within a shield, the Examiner cited col. 6, line 60 of Dill.

Applicant respectfully traverses the Examiner's rejection. Claim 1 recites:

1. A magnetic memory fabricated on a semiconductor substrate comprising:

a plurality of magnetic tunneling junctions, each of the plurality of magnetic tunneling junctions including a first ferromagnetic layer, a second ferromagnetic layer and an insulating layer between the first ferromagnetic layer and the second ferromagnetic layer; and

a plurality of shields for magnetically shielding the plurality of magnetic tunneling junctions, at least a portion of the plurality of shields having a high moment and a high permeability and being conductive, the plurality of shields being electrically isolated from the plurality of magnetic tunneling junctions, the plurality of magnetic tunneling junctions being between the plurality of shields.

Because the shields have a high permeability, a high moment, and are conductive, a low reluctance path for stray magnetic fields is provided, Specification, page 5, line 23-page 6, line

1. Consequently, the shields are particularly effective at preventing stray fields from reaching and deprogramming the magnetic tunneling junctions that store data. Specification, page 5, lines 11-13 and page 6, lines 1-4.

Applicant respectfully disagrees that Dill teaches or suggests the magnetic memory recited in claim 1. Dill does not describe a magnetic memory that is fabricated on a semiconductor substrate and that includes magnetic tunneling junctions in conjunction with the recited conductive shields. Instead, as the title of Dill indicates, Dill describes a shielded magnetic tunnel junction magnetoresistive *read head*. Fig. 3 of Dill, which was cited by the Examiner, indicates that the magnetoresistive sensor, 40 is part of a read/write head. Dill, Fig. 3 and col. 4, lines 24-63. The remaining portion of Dill also describes the magnetic read/write head of Dill. See, for example, Dill, col. 5, lines 6-31 and Figs. 4A-5. Applicant has found no mention in Dill of a magnetic memory that itself is formed on a semiconductor substrate. The technology described in Dill is, therefore, used in reading data that is stored in conventional magnetic recording media. The apparatus of Dill does not in and of itself store data. Consequently, Dill does not describe a magnetic memory formed on a semiconductor substrate. Although the magnetoresistive read head of Dill uses conductive shields for a magnetic tunneling junction in a read head, there is no indication that such shields can or should be used within a magnetic memory. Consequently, Dill

does not teach or suggest the recited magnetic memory formed on a semiconductor substrate and including both magnetic tunneling junctions and conductive shields. Thus, Dill fails to teach or suggest the magnetic memory recited in claim 1. Accordingly, Applicant respectfully submits that claim 1 is allowable over the cited references.

Claims 2-3 depend upon independent claim 1. Consequently, the arguments herein apply with full force to claims 2-3. Accordingly, claims 2-3 are allowable over the cited references.

Claims 2-3 are separately allowable over the cited references. Claim 2 recites:

2. The magnetic memory of claim 1 wherein a first shield of the plurality of shields includes a first magnetic layer having a first easy access and a second magnetic layer having a second easy axis perpendicular to the first easy access.

Similarly, claim 3 recites:

3. The magnetic memory of claim 2 wherein a second shield of the plurality of shields includes a third magnetic layer having a third easy access and a fourth magnetic layer having a fourth easy axis perpendicular to the fourth easy access.

Thus, the magnetic memories recited in claims 2 and 3 include shields having two layers. The two layers of the shields recited in claims 2 and 3 have perpendicular easy axes. Because the shield includes two layers having perpendicular easy axes, the shields are better able to respond to stray fields. Specification, page 6, lines 9-13.

Dill fails to teach or suggest the recited shields including two layers having perpendicular easy axes. The portion of Dill cited by the Examiner (col. 6, line 60) refers to how the magnetizations of the layers of the magnetic tunneling junction are oriented during fabrication. See, Dill, col. 6, lines 60-67. Thus, the cited portion of Dill does not describe using multiple layers having perpendicular easy axes in a shield. Applicant has also found no discussion in the remaining portions of Dill of utilizing shields having two layers. More particularly, Applicant has found no

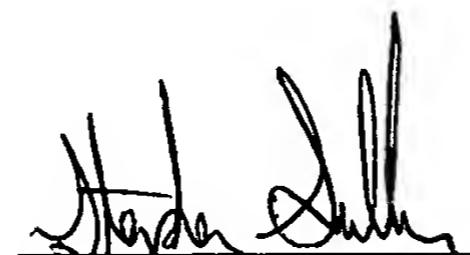
discussion in Dill of shields including two layers having perpendicular easy axes. Consequently, Dill fails to teach or suggest the recited shield including “a first magnetic layer having a first easy access and a second magnetic layer having a second easy axis perpendicular to the first easy access.” Dill thus fails to teach or suggest the magnetic memories recited in claims 2 and 3. Accordingly, Applicant respectfully submits that claims 2 and 3 are separately allowable over the cited references.

In the above-identified Office Action, the Examiner also rejected claims 4-10 under 35 U.S.C. § 103 as being unpatentable over Dill.

Applicant respectfully traverses the Examiner’s rejection. Claims 4-10 depend upon independent claim 1. Consequently, the arguments herein apply with full force to claims 4-10. Accordingly, Applicant respectfully submits that claims 4-10 are also allowable over the cited references.

Applicant’s attorney believes that this application is in condition for allowance. Should any unresolved issues remain, Examiner is invited to call Applicant’s attorney at the telephone number indicated below.

Respectfully submitted,



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